



TYPE T SQUEEZE PACKER

RIGHT-HAND MANUAL SET

10-3/4" X 4-1/2"

Manual No:
DL-621-10750-443

Revision: **C**

Revision Date:
11/18/2020

Authored by: *B.Mathis*

Approved by: *H.Bringham*

A) DESCRIPTION

The Type T Squeeze Packer is a versatile, easy to use tension set tool which holds differential pressure from above or below. This packer is designed to run, set, reset and retrieve easily, even under adverse conditions. This packer can be set at any depth and is used when insufficient weight is available to set a compression packer. This packer is ideal for squeeze cementing, casing testing, stimulation treatments and straddle operations using a retrievable bridge plug.

An SC Tension Unloader is generally run above this packer allowing pressure equalization before release. The SC Tension Unloader also provides a by-pass when running and retrieving to minimize swabbing of the elements.

This packer features a full bore that minimizes the potential for screening out during fracturing, does not restrict the flow rates and allows the use of through-tubing tools without pulling the packer.

This packer also features an emergency release system that uses a high-ratio left-hand thread. Applying right-hand rotation of the tubing relaxes the packing elements and moves the lower cone well away from the slips allowing the slips to fully retract.

B) RELATED TOOLS (sold separately)

B-1) 4-1/2" SC Tension Unloader (P/N 52545)—refer to technical manual *DL-525-4500-749*.

C) SPECIFICATION GUIDE

CASING			TOOL		THREAD CONNECTION BOX UP / PIN DOWN	PART NUMBER
SIZE (INCHES)	WEIGHT (LBS/FT)	RECOMMENDED HOLE SIZE (INCHES)	GAGE OD (INCHES)	NOMINAL ID (INCHES)		
10-3/4	32.75 – 55.5	9.760 – 10.192	9.500	4.00	4-1/2 EUE	62110RM 62110RMH ¹ 62110RMV ²
	60.7 – 85.3	9.156 – 9.660	9.000	4.00	4-1/2 EUE	62110XRM 62110XRMH ¹ 62110XRMV ²

Elastomer Trim Options: ¹HSN, ²Viton

NOTE₁: Tools listed are right-hand manual set. Other configurations are available. Contact D&L Sales for more information.

DIFFERENTIAL PRESSURE (MAX)	TENSILE LOAD THRU TOOL (MAX)
8,000 PSI	288,000 LBS

D & L OIL TOOLS
P.O. BOX 52220 TULSA, OK 74152
PHONE: (800) 441-3504 www.dloiltools.com

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D) PRE-INSTALLATION INSPECTION PROCEDURES

CAUTION₁: D&L ships tool connections made-up **HAND TIGHT**—labeled with hand-tight tape on the tool (Fig. 1)—unless stated otherwise. Tighten/torque all connections properly before operating tool.



Fig. 1

GENERAL THREAD CONNECTION TORQUE RECOMMENDATIONS			
STUB ACME / ACME THREADS	INTERNAL TAPERED TUBING THREADS		PREMIUM THREADS
	UP TO 2-3/8"	GREATER THAN 2-3/8"	
600 – 800 FT-LBS	600 – 800 FT-LBS	800 – 1,200 FT-LBS	Consult thread manufacturer's recommendations.

GENERAL SCREW TORQUE RECOMMENDATIONS									
SCREW SIZE (INCHES)	#6	#8	#10	1/4	5/16	3/8	7/16	1/2	5/8 and larger
TORQUE RANGE (INCH-POUNDS)	5 – 8	10 – 15	18 – 25	25 – 40	50 – 80	90 – 135	160 – 210	250 – 330	450 - 650

Before first use, D&L recommends disassembly and inspection of the tool unless stated otherwise. Ensure parts have not been damaged during shipping. Replace damaged parts with D&L replacement parts. Contact D&L sales for replacement part information.

Re-assemble the tool after inspection. Install parts in the correct order and orientation. Properly tighten connections.

Before re-using the tool, D&L recommends disassembly and inspection of the tool. Clean parts and ensure parts are in good working condition. Replace worn or damaged parts with D&L replacement parts.

When redressing the tool, D&L recommends replacement of all seals, elements, o-rings, shear screws, etc. Contact D&L sales for redress kit and/or other replacement part information.

E) OPERATION

NOTE₂: Always run a D&L SC Unloader above the T-Squeeze Packer if pressure equalization is required.

NOTE₃: When using a tubing tester, it must be run **above** the SC Unloader.

CAUTION₂: Do not run the tool without properly tightening connections. Running the tool with loose connections may damage the tool and cause malfunction.

E-1) SETTING PROCEDURES

The SC Unloader is usually run above the Type T Squeeze Packer. When the packer is run in, the unloader is open allowing the circulation of well fluids through and around the tool. To set the packer, pick up and rotate 1/3 turn to the right (or left if left-hand set) at the packer. Hold torque and slack off work string. The packing elements are not yet compressed, so circulation around the tool can be maintained. Tension is then pulled to compress the elements and close the unloader (22,000 lbs minimum). Factors such as pressure and temperature (which can shorten or elongate the tubing) should be carefully considered when determining the amount of tension to be applied.

CAUTION₃: When running the Type T Squeeze Packer with a retrievable bridge plug, make sure the retrieving tool J-slots are compatible with the packer. Whichever direction you get off the plug, the packer should set in the **opposite** direction to avoid getting the two tools set together. For other J-slot configurations, contact D&L Oil Tools.

E-2) RELEASING PROCEDURES

Slack off work string weight to open the unloader and equalize pressure. Rotate the tubing 1/3 turn to the left (or right if left-hand set) at the packer and pick up while holding torque. The packer is free to be moved and re-set or pulled from the hole.



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E) OPERATION (cont'd)

E-3) SAFETY RELEASE PROCEDURE

In the event the packer cannot be released in the normal manner, rotation of the tubing to the right will force the slips to release and the packing elements to relax. This is accomplished through the left-hand jacking thread connection between the upper mandrel and central coupling. Right-hand rotation at the tool jacks the mandrel up, equalizing the pressure across the tubing, until it hits the jack nut. Continued rotation will jack the lower mandrel down forcing the lower cone away from the slips and the rubber retainer away from the packed off elements. At this point the packer may be pulled out of the well or by re-jacking and then rotating to the left until the jacking thread returns to its original position. The packer may then be re-set.

NOTE4: The quantity of turns it takes to release the packer is variable, depending on the casing weight and the tension originally pulled to set the packer. Contact D&L Sales for the correct quantity of turns.

F) STORAGE RECOMMENDATIONS

When preparing the tool for storage, follow the Pre-Installation Inspection Procedures. Re-assemble the tool with connections hand-tight only and in running position if applicable. Elements should be in a relaxed state—free from tension, compression, and other stresses that could cause deformation.

Store the tool, if possible, in an enclosed, temperature and humidity controlled environment. Avoid excessively high temperatures over long periods of time. Shield elastomeric parts from ultraviolet light sources. Keep tool dry and protected from condensation. Do not store in contact with or near volatile or corrosive chemicals. Do not store near ozone generating equipment or operations such as welding.

G) ELASTOMER TRIM TEMPERATURE GUIDE

NITRILE (STD)			
TEMPERATURE RANGE (F°)	DUROMETER		
	END	MIDDLE	END
40° - 125°	80	70	80
125° - 250°	90	70	90
150° - 250°	90	80	90
250° +	Contact D&L Sales		

RUBBER TYPE	TEMPERATURE RANGE (F°)
NITRILE	40° - 250°F
HSN (HNBR)	70° - 300°F
VITON	100° - 350°F

H) RECOMMENDED TOOLS

H-1) HAND TOOLS

- VISE
- GLOVES
- ALLEN WRENCHES
- TAPE MEASURE
- O-RING PICK
- BAR
 - 1/2-INCH
 - 3/4-INCH
- PAINT BRUSH, 2-INCH
- PIPE WRENCH, 3-FT (2 EA)
- "CHEATER" PIPE, 4-FT LONG
- ADJUSTABLE WRENCH, 12-INCH
- CORDLESS DRILL, 18V
- SNAP RING SPREADER PLIERS
- ALIGNING PUNCH
- SCREWDRIVER SET, FLAT-TIPPED
- SOCKET SETS
 - 3/8-INCH DRIVE
 - 1/2-INCH DRIVE
- HAMMERS
 - SLEDGE
 - BALL PEEN
 - DEAD BLOW

H-2) SPECIAL TOOLS

ITEM	QTY	DESCRIPTION	PART NUMBER
T1	1	DRAW BLOCK ASSEMBLY TOOL	AT010110



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I) DISASSEMBLY

NOTE₅: Ensure vise is capable of handling weight of tool.

NOTE₆: Support tool during disassembly and assembly with jack stands as necessary.

I-1) Clamp J-body (6) in vise.

I-1.1) Unscrew and remove set screws (23) from bottom sub (21).

I-1.2) Unscrew and remove bottom sub assembly from lower mandrel (4) and disassemble:

I-1.2.1) Unscrew and remove bottom sub (21) from rubber retainer (15).

I-1.2.2) Remove o-ring (24) from bottom sub (21).

I-1.2.3) Remove o-ring (27) from rubber retainer (15).

I-1.3) Remove elements (13, 14) and rubber spacers (12) from rubber mandrel (11).

I-1.4) Unscrew and remove rubber mandrel (11) from lower cone (16).

I-1.5) Remove lower cone (16) from lower mandrel (4).

I-1.5.1) Remove o-rings (25) from lower cone (16).

I-2) Rotate and slide inner tool components into set position (Fig. 2).

I-2.1) Unscrew and remove coupling (1) from upper mandrel (2).

I-2.2) Compress drag blocks (19) with drag block assembly tool (T1).

I-2.3) Unscrew and remove jack nut (5) from drag block body (18).

I-2.4) Release drag blocks (19). Remove drag blocks (19) and drag block springs (3).

I-2.5) Unscrew and remove set screws (22 or 23) from drag block body (18).

I-2.6) Unscrew and remove drag block body (18) from J-body (6).

I-2.7) Unscrew and remove upper mandrel (2) from center coupling (10) (**NOTE₇:** Left-hand threads).

I-2.8) Unscrew and remove set screws (23) from center coupling (10). Move J-body (6) as needed to access screws.

I-2.9) Unscrew and remove center coupling (10) from lower mandrel (4).

I-2.9.1) Remove o-rings (26) from center coupling (10).

I-2.10) Remove J-pin retainer (8) from J-body (6).

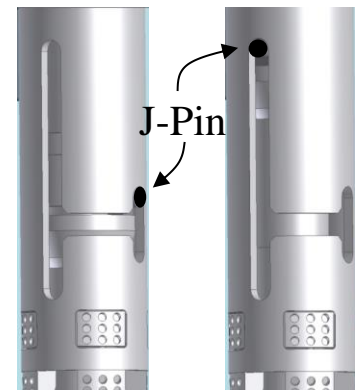
I-2.11) Remove removable J-pins (7) from lower mandrel (4) through J-slots in J-body (6). Move J-pins downwards in J-slots as necessary to be removed.

I-2.12) Remove lower mandrel (4) from lower end of J-body (6).

I-2.13) Remove upper cone (9) from upper end of J-body (6).

I-2.14) Remove slips (17) and slip springs (20) from J-body (6).

I-3) Unclamp and remove J-body (6) from vise.



Run/Retrieve Position Set Position
Fig. 2



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J) ASSEMBLY

NOTE₉: Clean and inspect all parts. Replace all worn and damaged parts. Install parts in proper order, and orientation and tighten/torque all connections properly.

CAUTION₄: To ensure tool operates properly, install o-rings in o-ring grooves **NOT** thread reliefs (Fig. 3).

NOTE₅: Ensure vise is capable of handling weight of tool.

NOTE₆: Support tool during disassembly and assembly with jack stands as necessary.

J-1) Clamp J-body (6) in vise.

J-1.1) Install slips (17) and slip springs (20) into J-body (6). Wedge slips (17) outwards.

NOTE₁₀: Install two (2 ea) springs per slip (Fig. 4).

J-1.2) Install upper cone (9) into J-body (6) from upper end.

J-1.3) Install lower mandrel (4) into lower end of J-body (6) and through upper cone (9).

NOTE₁₁: Additional force may be required while sliding lower mandrel (4) into upper cone (9).

J-1.4) Align recessed areas in lower mandrel (4) with slots in J-body (6). Install removable J-pins (7) through J-slots and seat in recesses.

J-1.5) Slide the lower mandrel (4) with removable J-pins (7) toward upper end of J-body (6) to ends of J-pins (7) with upper cone (9).

J-1.6) Install J-pin retainer (8) into J-body (6). Align so removable J-pins (7) slip into notches.

J-1.7) Install o-rings (26) in grooves in center coupling (10).

J-1.8) Screw center coupling (10) onto lower mandrel (4).

CAUTION₅: Do NOT rip or tear o-ring during installation.

J-1.9) Screw set screws (23) into center coupling (10).

J-1.10) Screw upper mandrel (2) into center coupling (10) (**NOTE₇:** Left-hand thread).

CAUTION₅: Do NOT rip or tear o-ring during installation.

J-1.11) Assemble drag block body assembly and install:

J-1.11.1) Install drag blocks (19) and drag block springs (3) in drag block body (18).

NOTE₁₂: Install six (6ea) springs per block (Fig. 5).

J-1.11.2) Compress drag blocks (19) with drag block assembly tool (T1).

J-1.11.3) Screw jack nut (5) onto drag block body (18). Be sure all tabs on the drag blocks are captured on both ends.

J-1.11.4) Install drag block body assembly onto upper mandrel (2). Screw drag block body assembly onto J-body (6).

J-1.12) Screw coupling (1) onto upper mandrel (2).

J-2) Rotate and slide inner tool components into run/retrieve position (Fig. 2).

J-2.1) Install o-rings (25) in grooves in lower cone (16).

J-2.2) Install lower cone (16) onto lower mandrel (4).

CAUTION₅: Do NOT rip or tear o-rings during installation.

NOTE₁₃: Additional force may be required to install lower cone onto lower mandrel.

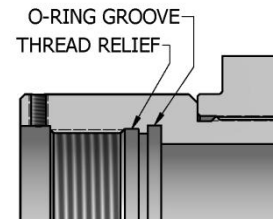


Fig. 3



Fig. 4



Fig. 5



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J) ASSEMBLY (cont'd)

J-2.3) Screw rubber mandrel (11) into lower cone (16).

NOTE: Do NOT damage seal surface.

J-2.4) Install elements (13, 14) and rubber spacers (12) onto rubber mandrel (11).

J-2.5) Assemble bottom sub assembly and install:

J-2.5.1) Install o-ring (24) in groove in bottom sub (21).

J-2.5.2) Install o-ring (27) in groove in rubber retainer (15).

J-2.5.3) Screw bottom sub assembly onto lower mandrel (4).

CAUTION: Do NOT rip or tear o-rings during installation.

J-2.6) Screw set screws (23) into bottom sub (21).

J-3) Unclamp J-body (6) from vise and removed assembled tool.

K) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 62110RM	P/N 62110XRM
1	1	COUPLING	DLMS80	CP4500E5500L	
2	1	UPPER MANDREL	DLMS110	62110210	
3	36	DRAW BLOCK SPRING	-	9101900	
4	1	LOWER MANDREL	DLMS110	62110230	
5	1	JACK NUT	DLMS110	62110950	62110X950
6	1	J-BODY	DLMS110 / DLMS80	62110340	62110X340
7	2	REMOVABLE J-PIN	DLMSFB4	62185120	
8	1	J-PIN RETAINER	DLMS125	62110920	
9	1	UPPER CONE	DLMS125	62110410	
10	1	CENTER COUPLING	DLMS110	62110620	
11	1	RUBBER MANDREL	DLMS110	62110220	
12	2	RUBBER SPACER	DLMS35	60210840-SRM	60210X840
13	1	ELEMENT	70 DURO NITRILE	60201511	60210X511
14	2	ELEMENT	90 DURO NITRILE	60201513	60210X513
15	1	RUBBER RETAINER	DLMS110	62110850	62110X850
16	1	LOWER CONE	DLMS110	62110420	62110X420
17	6	SLIP W/CARBIDE	DLMS110	62110110C	62110X110C
18	1	DRAW BLOCK BODY	DLMS110	62110330	62110X330
19	6	DRAW BLOCK W/CARBIDE	DLMSDB4	9080900C	9070900C
20	12	SLIP SPRING	-	7170902	
21	1	BOTTOM SUB	DLMS110	62110630	
22	3	SET SCREW 3/8-16 UNC X 1/4	STEEL	-	SSS037C025



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K) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 62110RM	P/N 62110XRM
23	-	SET SCREW 3/8-16 UNC X 3/8	STEEL	SSS037C037 (9EA)	(6EA)
24	1	355 O-RING	90 DURO NITRILE	90355	
25	2	356 O-RING	90 DURO NITRILE	90356	
26	2	357 O-RING	90 DURO NITRILE	90357	
27	1	362 O-RING	90 DURO NITRILE	90362	

REDRESS KIT (RDK)		62110050
ASSEMBLED WEIGHT		610 LBS

K-1) ELASTOMER TRIM OPTIONS

NOTE₁₄: For temperature range, refer to Elastomer Trim Temperature Guide.

K-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 62110RMH	P/N 62110XRMH
13	1	ELEMENT	70 DURO HSN	60201511H	60210X511H
14	2	ELEMENT	90 DURO HSN	60201513H	60210X513H
24	1	355 O-RING	90 DURO HSN	90355H	
25	2	356 O-RING	90 DURO HSN	90356H	
26	2	357 O-RING	90 DURO HSN	90357H	
27	1	362 O-RING	90 DURO HSN	90362H	

REDRESS KIT (RDK)		62110050H
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K-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 62110RMV	P/N 62110XRMV
13	1	ELEMENT	70 DURO VITON	60201511V	60210X511V
14	2	ELEMENT	90 DURO VITON	60201513V	60210X513V
24	1	355 O-RING	90 DURO VITON	90355V	
25	2	356 O-RING	90 DURO VITON	90356V	
26	2	357 O-RING	90 DURO VITON	90357V	
27	1	362 O-RING	90 DURO VITON	90362V	

REDRESS KIT (RDK)		62110050V
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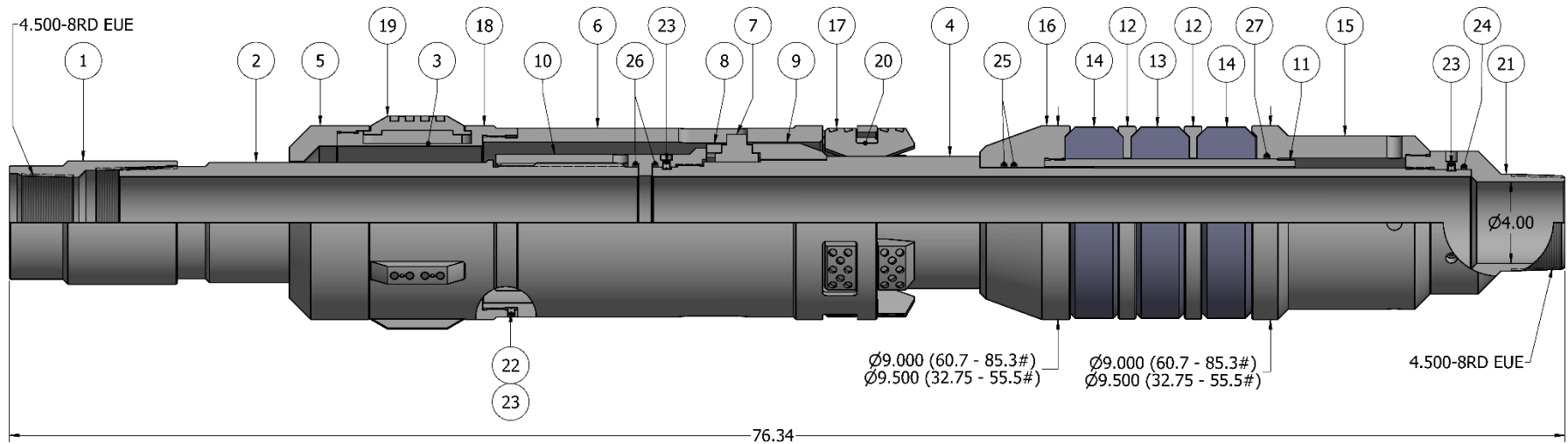
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L) TECHNICAL ILLUSTRATION



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M) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
11/18/2020	C	Removed tool drift ID; Added General Screw Torque Recommendations, Revised elastomer trim temp. rating, 90356 qty 2 was 1, 7170902 qty 12 was 6	J.Anderson	E.Visaez
10/13/14	B	Revised Operation section, P/N 60201513 WAS 60210513, 60201511 WAS 60210511, 60301840-SRM WAS 60210840 Added related tools, tool drift ID, max. diff. pressure and tensile load thru tool, HSN and Viton options, pre-installation and storage procedures, element selection guide, recommended hand tools; Removed Available J-slots section	J.Anderson	K.Plunkett